

COST OF CAPITAL STUDY

YIELD CAPITALIZATION

2020 Assessment Year

APPENDIX C

NATURAL GAS DISTRIBUTION

EQUITY RATE					8.50%		
CAPITAL ASSET PRICING MODEL						PAGE	
	CAPM Ex Ante		5.35%			4	
DIVIDEND GROWTH MODELS							
	Value Line, based on Dividends Growth		8.50%			5	
	Value Line, based on Earnings Growth		11.00%			6	
	Value Line, based on Return on Equity		6.50%			7	
	FCFE GROWTH MODEL Multi Stage		7.50%			8	
				RANGE	5.35% - 11%		
DEBT RATE					4.00%	9	
MARKET CAPITAL STRUCTURE							
	Equity	65%	x	8.50%	=	5.53%	3
	Debt	35%	x	4.00%	=	1.40%	3
	Marginal Tax Rate	24%	=	(1-.24)	x	1.40%	
						<u>1.06%</u>	
WEIGHTED AVERAGE COST OF CAPITAL					6.59%		

SUPPORT FOR GUIDELINE COMPANIES

Washington State Department of Revenue

2020 Assessment Year

Natural Gas Distribution

Capital Structure at Book Value

Company	Ticker	Beta	Fin'l Strength	P/E Ratio	Div'd Yield	Common Stock	%	Preferred Stock	%	Long Term Debt	%	Total Debt & Equity
Atmos Energy Corp	ato	0.55	A+	27.00	1.9%	5,890,791,105	57.7%		0.0%	4,324,300,000	42.3%	10,215,091,105
Chesapeake Util	cpk	0.60	A	26.90	1.9%	574,952,349	60.5%		0.0%	375,800,000	39.5%	950,752,349
New Jersey Resources	njr	0.65	A+	21.80	2.7%	1,660,065,091	51.9%		0.0%	1,537,600,000	48.1%	3,197,665,091
NiSource Inc	ni	0.55	B+	24.20	2.9%	5,098,857,295	36.9%	880,000,000	6.4%	7,853,800,000	56.8%	13,832,657,295
NW Natural Gas	nwn	0.55	A	34.50	2.6%	785,237,835	49.3%		0.0%	806,000,000	50.7%	1,591,237,835
South Jersey Industries	sjj	0.80	B++	28.90	3.6%	1,450,568,153	41.8%		0.0%	2,022,800,000	58.2%	3,473,368,153
Southwest Gas	swx	0.70	A	21.10	2.9%	2,439,061,616	49.8%		0.0%	2,462,100,000	50.2%	4,901,161,616
Spire Inc	sr	0.60	B++	25.40	2.8%	2,305,212,680	45.8%	242,000,000	4.8%	2,484,400,000	49.4%	5,031,612,680
ONE Gas Inc	ogs	0.60	A	28.50	2.1%	2,106,862,046	62.1%		0.0%	1,285,900,000	37.9%	3,392,762,046
UGI Corp	ugi	0.75	B++	15.60	2.5%	3,810,177,879	39.5%		0.0%	5,827,600,000	60.5%	9,637,777,879
	Mean	0.64		25.39	2.59%	2,612,178,605	49.5%		1.1%	2,898,030,000	49.4%	5,622,408,605
	Harmonic Mean	0.62		24.33	2.50%		48.1%				48.2%	
	Median	0.60		26.15	2.62%		49.6%		0.0%		49.8%	
	Weighted Mean					26,121,786,050	46.5%		0.0%	28,980,300,000	51.5%	56,224,086,050
	Say	0.62										

**SUPPORT FOR CAPITAL STRUCTURE
MARKET VALUE**

Washington State Department of Revenue

2020 Assessment Year

Natural Gas Distribution

Capital Structure at Market Value

Company	Ticker	Stock Price	Common Shares	Common Stock	%	Preferred Stock	%	Long Term Debt	%	Total Debt & Equity
Atmos Energy Corp	ato	111.860	122,266,316	13,676,710,108	76.4%	-	0.0%	4,216,249,000	23.6%	17,892,959,108
Chesapeake Util	cpk	81.300	16,403,776	1,333,626,989	72.5%	-	0.0%	505,000,000	27.5%	1,838,626,989
New Jersey Resources	njr	44.570	95,570,817	4,259,591,314	73.1%	-	0.0%	1,568,864,000	26.9%	5,828,455,314
NiSource Inc	ni	27.840	373,542,659	10,399,427,627	51.9%	880,000,000	4.4%	8,764,400,000	43.7%	20,043,827,627
NW Natural Gas	nwn	73.730	30,435,575	2,244,014,945	70.9%	-	0.0%	919,835,000	29.1%	3,163,849,945
South Jersey Industries	sjj	32.980	92,392,876	3,047,117,050	52.7%	-	0.0%	2,730,000,000	47.3%	5,777,117,050
Southwest Gas	swx	75.970	54,626,240	4,149,955,453	60.8%	-	0.0%	2,672,077,000	39.2%	6,822,032,453
Spire Inc	sr	83.310	51,068,070	4,254,480,912	62.3%	242,000,000	3.5%	2,333,400,000	34.2%	6,829,880,912
ONE Gas Inc	ogs	93.570	52,737,473	4,934,645,349	76.7%	-	0.0%	1,500,000,000	23.3%	6,434,645,349
UGI Corp	ugi	45.160	208,548,324	9,418,042,312	60.3%	-	0.0%	6,189,300,000	39.7%	15,607,342,312
Mean					65.8%				33.4%	
Harmonic Mean					64.5%				31.5%	
Median					66.6%				31.6%	
Weighted Mean				57,717,612,057	64.0%	1,122,000,000	1.2%	31,399,125,000	34.8%	90,238,737,057
Std Dev					9.4%				8.6%	
Coefficient of Variation					14.2%				25.7%	
Say					65%				35%	100%

SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT CAPITAL ASSET PRICING MODEL

Washington State Department of Revenue
2019 Assessment Year - Natural Gas Distribution

Ex Ante
 $Ke = Rf + B (Rp)$

Ke = Cost of Equity				5.35%
				to page 1
	Rm =	rate of return	7.15%	
	Rf =	risk free rate	2.40%	
	Rp =	risk premium	4.75%	
	B =	Beta	0.62	page 7
Rp = Risk Premium				4.75%
				to above
	Shannon Pratt and Roger Grabowski		3.50%-6.00%	
	Cost of Capital, App and Exam, 5th Ed, 2014			
	Dr. Aswath Damodaran		5.20%	chart page 15
	http://pages.stern.nyu.edu/~adamodar/		4.72%	adjusted for Rf
	2020 Implied Premium			
	John Graham and Campbell Harvey		6.81%	10 year expected real return
	Duke CFO magazine Global Business Outlook survey -		6.30-7.32%	95% Interval 10 year expect
	4th Quarter - Dec 2019 pg 38		6.23%	adjusted for Rf
			1.82%	Rf rate used in survey
Rf = Risk Free Rate				2.40%
				to above
	Value Line Investment Survey, Selected Yields January 10, 2020, page 1313			
	as of 12-31-19	US Treasury Securities year end data		
		5 year	1.69%	
		10 year	1.92%	
		30 year	2.39%	
		30 year Zero	2.42%	
	Federal Reserve Statistical Release (http://www.federalreserve.gov/Releases/H15/Current/)			
	as of 12-31-19	Treasury Constant Maturities		
		5 year	1.69%	
		10 year	1.92%	
		20 year	2.25%	
		30 year	2.39%	
		20 year TIPS	<u>0.39%</u>	1.86%
		30 year TIPS	<u>0.58%</u>	1.81%
				TIPS inflation indication
Inflation				2.00%
				to appraisal template
	Value Line Investment Survey, Economic Series January 3, 2020, page 1500			
	Consumer Price Index Annual Rate of Change 2022-2024			2.50%
	The Livingston Survey December 13, 2019, page 4, 10			
	Inflation median (measured by the CPI) over next 10 years			2.22%
Gross Domestic Product (GDP) Nominal				3.90%
				real GDP + inflation est
	Federal Reserve Projected Long Run Real GDP Growth			
	Median Projection Value From December 11, 2019 Report			1.90%
	https://www.federalreserve.gov/monetarypolicy/fomcprojtabl20191211.htm			
	Congressional Budget Office Real GDP Economic Projections			
	The Budget and Economic Outlook 2020-2030			Table B-1, pg 75
	Average Percentage Change Year To Year	2020-2024		1.80%
	http://www.cbo.gov/publication/56020	2025-2030		1.65%
	Federal Reserve Bank of Philadelphia			
	The Livingston Survey, December 13, 2019, page 4, 10			
	Average Annual Real GDP Growth Rate for Next Ten Years			2.00%
	https://www.philadelphiafed.org/research-and-data/real-time-center/livingston-survey			

SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT DIVIDEND GROWTH MODEL

Washington State Department of Revenue

2020 Assessment Year

Natural Gas Distribution

Based on Dividend Growth

$$K_e = (D1 / P_o) + G$$

Ke = Cost of Equity
 D1 = Expected Dividends
 Po = Current Price
 G = Sustainable Growth

Company	Ticker	Stock Price (Po)	Expected Dividend (D1)	Dividend Yield (D1/Po)	Dividend Short Term Growth (G)	K _e Short Term Growth
Atmos Energy Corp	ato	111.86	2.30	2.06%	7.50%	9.56%
Cheapeake Util	cpk	81.30	1.69	2.08%	9.00%	11.08%
New Jersey Resources	njr	44.57	1.27	2.85%	6.00%	8.85%
NiSource Inc	ni	27.84	0.86	3.09%	7.50%	10.59%
NW Natural Gas	nwn	73.73	1.91	2.59%	0.50%	3.09%
South Jersey Industries	sji	32.98	1.25	3.79%	4.00%	7.79%
Southwest Gas	swx	75.97	2.30	3.03%	5.00%	8.03%
Spire Inc	sr	83.31	2.49	2.99%	5.00%	7.99%
ONE Gas Inc	ogs	93.57	2.16	2.31%	8.00%	10.31%
UGI Corp	ugi	45.16	1.30	2.88%	6.00%	8.88%
Mean						8.62%
Harmonic Mean						7.61%
Median						8.86%
Max						11.08%
Min						3.09%
Std Dev						2.26%
Coefficient of Variation						26.18%
Say						8.50%

**SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT
DIVIDEND GROWTH MODEL**

Washington State Department of Revenue

2020 Assessment Year

Natural Gas Distribution

Based on Earnings Growth

$K_e = (D1 / P_o) + G$

- Ke = Cost of Equity
- D1 = Expected Dividends
- Po = Current Price
- G = Sustainable Growth

Company	Ticker	Stock Price (Po)	Expected Dividends (D1)	Yield (D1/Po)	Earnings Short Term Growth (G)	Ke Short Term Growth
Atmos Energy Corp	ato	111.86	2.30	2.06%	7.0%	9.06%
Chesapeake Util	cpk	81.30	1.69	2.08%	9.0%	11.08%
New Jersey Resources	njr	44.57	1.27	2.85%	2.5%	5.35%
NiSource Inc	ni	27.84	0.86	3.09%	2.5%	5.59%
NW Natural Gas	nwn	73.73	1.91	2.59%	22.5%	25.09%
South Jersey Industries	sjj	32.98	1.25	3.79%	10.5%	14.29%
Southwest Gas	swx	75.97	2.30	3.03%	9.0%	12.03%
Spire Inc	sr	83.31	2.49	2.99%	5.5%	8.49%
ONE Gas Inc	ogs	93.57	2.16	2.31%	7.0%	9.31%
UGI Corp	ugi	45.16	1.30	2.88%	9.5%	12.38%
Mean						11.27%
Harmonic Mean						9.38%
Median						10.19%
Max						25.09%
Min						5.35%
Std Dev						5.63%
Coefficient of Variation						50.02%
Say						11.00%

SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT DIVIDEND GROWTH MODEL

Washington State Department of Revenue
2020 Assessment Year
Natural Gas Distribution

Based on Return on Equity

$K_e = (D1 / P_o) + G$

K_e = Cost of Equity
 $D1$ = Expected Dividends
 $E1$ = Expected Earnings
 P_o = Current Price
 G = Sustainable Growth
 b = Retained Earnings % = (1 - Payout Ratio)
 ROE = Return on Equity = ($E1 / P_o$)

Company	Ticker	Stock Price (Po)	Expected Dividend (D1)	Expected Earnings (E1)	Dividend Yield (D1/Po)	Retained Earnings (b)	ROE (E1/Po)	Growth (b*ROE)	K_e Dividends	K_e Earnings
Atmos Energy Corp	ato	111.860	2.30	4.65	2.1%	52.0%	4.16%	2.16%	4.22%	6.32%
Chesapeake Util	cpk	81.300	1.69	3.65	2.1%	54.0%	4.49%	2.42%	4.50%	6.91%
New Jersey Resources	njr	44.570	1.27	2.05	2.8%	39.0%	4.60%	1.79%	4.64%	6.39%
NiSource Inc	ni	27.840	0.86	1.40	3.1%	30.0%	5.03%	1.51%	4.60%	6.54%
NW Natural Gas	nwn	73.730	1.91	2.40	2.6%	10.0%	3.26%	0.33%	2.92%	3.58%
South Jersey Industries	sjj	32.980	1.25	1.60	3.8%	nmf	4.85%	nmf	nmf	nmf
Southwest Gas	swx	75.970	2.30	4.25	3.0%	42.0%	5.59%	2.35%	5.38%	7.94%
Spire Inc	sr	83.310	2.49	3.80	3.0%	34.0%	4.56%	1.55%	4.54%	6.11%
ONE Gas Inc	ogs	93.570	2.16	3.65	2.3%	43.0%	3.90%	1.68%	3.99%	5.58%
UGI Corp	ugi	45.160	1.30	2.95	2.9%	52.0%	6.53%	3.40%	6.28%	9.93%
Mean									4.56%	6.59%
Harmonic Mean									4.39%	6.16%
Median									4.54%	6.39%
Max									6.28%	9.93%
Min									2.92%	3.58%
Std Dev									0.92%	1.71%
Coefficient of Variation									20.17%	26.02%

say 6.50%

**SUPPORT FOR YIELD CAPITALIZATION EQUITY COMPONENT
FREE CASH FLOW TO EQUITY MODEL MULTI STAGE**

Washington State Department of Revenue

2020 Assessment Year

Natural Gas Distribution

Company	Ticker	Stock Price	Expected Earnings	P/E	Payout Ratio	ROE	Ke
Atmos Energy Corp	ato	111.86	4.65	24.06	50.00%	9.00%	6.20%
Chesapeake Util	cpk	81.30	3.65	22.27	46.00%	9.00%	8.22%
New Jersey Resources	njr	44.57	2.05	21.74	62.00%	10.00%	6.61%
NiSource Inc	ni	27.84	1.40	19.89	64.00%	8.50%	9.86%
NW Natural Gas	nwn	73.73	2.40	30.72	79.00%	9.00%	4.54%
South Jersey Industries	sji	32.98	1.60	20.61	80.00%	9.50%	9.02%
Southwest Gas	swx	75.97	4.25	17.88	56.00%	8.50%	9.98%
Spire Inc	sr	83.31	3.80	21.92	66.00%	7.00%	7.62%
UGI Corp	ugi	45.16	2.95	15.31	46.00%	15.00%	11.93%
ONE Gas Inc	ogs	93.57	3.65	25.64	59.00%	9.00%	5.56%
Mean				22.00	60.80%	9.45%	7.95%
Harmonic Mean				21.29	58.70%	9.14%	7.34%
Median				21.83	60.50%	9.00%	7.92%
Industry Summary				22.00	58.00%	9.00%	
						Say	7.50%

SUPPORT FOR DEBT RATING AND DEBT YIELD RATE

Washington State Department of Revenue

2020 Assessment Year

Natural Gas Distribution

Company	Ticker	Mergent's Ratings	S&P Ratings
Atmos Energy Corp	ato	A1	A
Chesapeake Util	cpk		
New Jersey Resources	njr		
NiSource Inc	ni	Baa2	BBB+
NW Natural Gas	nwn	Baa1	A+
South Jersey Industries	sjj	A3	BBB
Southwest Gas	swx	A3	BBB+
Spire Inc	sr	Baa2	A-
UGI Corp	ugi		
ONE Gas Inc	ogs	A2	A
Overall Average Debt Rating		A3	A-

Mergent's Bond Record January 2020, page 234				
Corporate	Aaa	Aa	A	Baa
October	3.01%	3.13%	3.37%	3.93%
November	3.06%	3.16%	3.40%	3.94%
December	3.01%	3.11%	3.36%	3.88%
4th Qtr Average	3.03%	3.13%	3.38%	3.92%
Public Utilities	Aaa	Aa	A	Baa
October		3.24%	3.39%	3.72%
November		3.25%	3.43%	3.76%
December		3.22%	3.40%	3.73%
4th Qtr Average		3.24%	3.41%	3.74%
Industrials	Aaa	Aa	A	Baa
October	3.01%	3.01%	3.35%	4.12%
November	3.06%	3.06%	3.37%	4.12%
December	3.01%	3.00%	3.32%	4.03%
4th Qtr Average	3.03%	3.02%	3.35%	4.09%

		Ave YTM	Med YTM
S&P's Long Term Bond Yield	A-	4.63%	4.49%
Moody's Long Term Bond Yield	A3	4.93%	4.75%

Bloomberg Dec 2019	20y	25Y	30Y
A-	3.72%	3.67%	3.66%

Debt Yield Rate	4.00%
------------------------	--------------

to page 1

SUPPORT FOR DIRECT CAPITALIZATION EQUITY COMPONENT

Washington State Department of Revenue

2020 Assessment Year

Natural Gas Distribution

Company	Ticker	Stock Price	2019		2020		2019		2020	
			Actual Earnings Ratio (EPS/P)	Projected Earnings Ratio (PEPS/P)	Cash Flow Ratio (CF/P)	Projected Cash Flow Ratio				
Atmos Energy Corp	ato	111.86	4.35	3.9%	4.65	4.2%	7.57	6.8%	8.00	7.2%
Chesapeake Util	cpk	81.30	3.40	4.2%	3.65	4.5%	6.65	8.2%	7.10	8.7%
New Jersey Resources	njr	44.57	1.96	4.4%	2.05	4.6%	2.99	6.7%	3.05	6.8%
NiSource Inc	ni	27.84	1.25	4.5%	1.40	5.0%	2.80	10.1%	3.00	10.8%
NW Natural Gas	nwn	73.73	2.10	2.8%	2.40	3.3%	4.50	6.1%	4.90	6.6%
South Jersey Industries	sjj	32.98	1.10	3.3%	1.60	4.9%	2.15	6.5%	2.70	8.2%
South Jersey Industries	sjj	32.98	1.10	3.3%	4.25	12.9%	2.15	6.5%	9.75	29.6%
Southwest Gas	swx	75.97	3.80	5.0%	3.80	5.0%	9.10	12.0%	7.60	10.0%
Spire Inc	sr	83.31	3.52	4.2%	2.95	3.5%	7.12	8.5%	5.15	6.2%
UGI Corp	ugi	45.16	2.28	5.0%	2.95	6.5%	4.12	9.1%	5.15	11.4%
ONE Gas Inc	ogs	93.57	3.51	3.8%	3.65	3.9%	6.95	7.4%	7.40	7.9%
		Mean		4.0%		5.3%		8.0%		10.3%
		Harmonic Mean		3.9%		4.7%		7.7%		8.6%
		Median		4.2%		4.6%		7.4%		8.2%
		Max		5.0%		12.9%		12.0%		29.6%
		Min		2.8%		3.3%		6.1%		6.2%
		Std Dev		0.7%		2.7%		1.8%		6.6%
		Coefficient of Variation		17.2%		50.4%		22.8%		64.2%
		Say		4.0%		5.0%		8.0%		9.0%

Source:

Actual earnings: Value Line / Q4 average stock price

Estimated Earnings: Value Line / Q4 average stock price

Actual Cash Flow: Value Line / Q4 average stock price

Estimated Cash Flow: Value Line / Q4 average stock price

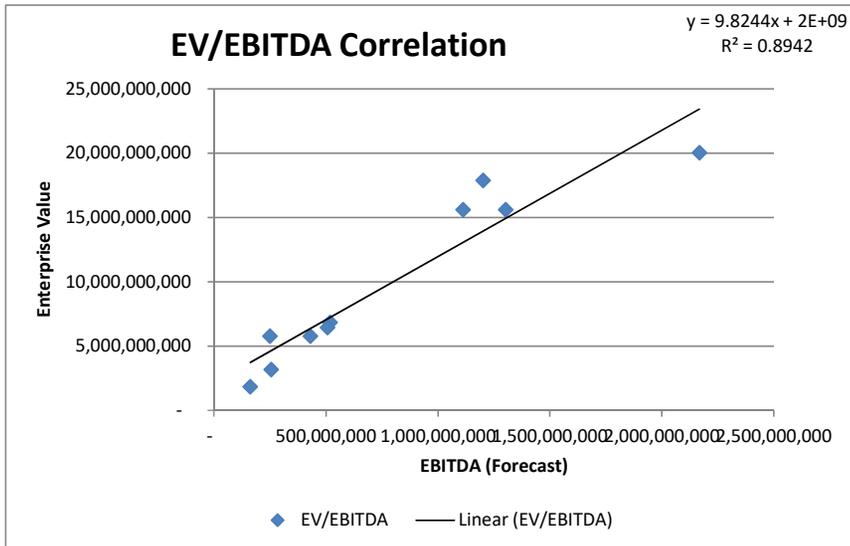
SUPPORT FOR DIRECT CAPITALIZATION EQUITY COMPONENT

Washington State Department of Revenue

2020 Assessment Year

Natural Gas Distribution

Company	Ticker	Stock Price	Enterprise Value	EBITDA Historical	Annual Change VL	EBITDA Forecast	EV / EBITDA Forecast	Revenue Forecast	EV / Sales Forecast	Cash Flow Forecast	Debt Service	EV / CF Forecast
Atmos Energy Corp	ato	111.86	17,892,959,108	1,137,514,000	5.68%	1,202,128,402	14.88	2,995,524,742	5.97	978,130,528	168,649,960	15.60
Chesapeake Util	cpk	81.30	1,838,626,989	152,187,000	6.77%	162,485,368	11.32	636,466,509	2.89	116,466,810	20,200,000	13.45
New Jersey Resources	njr	44.57	5,763,226,314	245,665,000	2.01%	250,594,732	23.00	2,537,405,191	2.27	291,490,992	62,754,560	16.27
NiSource Inc	ni	27.84	20,043,827,627	2,022,600,000	7.14%	2,167,071,429	9.25	5,547,108,486	3.61	1,120,627,977	350,576,000	13.62
NW Natural Gas	nwn	73.73	3,163,849,945	234,970,000	8.89%	255,856,222	12.37	765,454,711	4.13	149,134,318	36,793,400	17.02
South Jersey Industries	sji	32.98	5,777,117,050	342,202,000	25.58%	429,742,047	13.44	1,644,593,193	3.51	249,460,765	109,200,000	16.11
Southwest Gas	swx	75.97	6,829,880,912	484,000,000	7.14%	518,571,429	13.17	3,108,233,056	2.20	532,605,840	106,883,080	10.68
Spire Inc	sr	83.31	15,607,342,312	1,041,700,000	6.74%	1,111,926,966	14.04	1,935,479,853	8.06	388,117,332	93,336,000	32.42
UGI Corp	ugi	45.16	15,607,342,312	1,041,700,000	25.00%	1,302,125,000	11.99	8,195,949,133	1.90	1,074,023,869	247,572,000	11.81
ONE Gas Inc	ogs	93.57	6,434,645,349	475,623,000	6.47%	506,418,734	12.71	1,713,967,873	3.75	390,257,300	60,000,000	14.29
Mean							13.62		3.83			16.13
Harmonic Mean							12.96					14.85
Median							12.94					14.95
Std Dev							3.64		1.90			6.07
Coefficient of Variation							0.27		0.50			0.38
Say							12.00		3.50			15.00



Forecast EV/EBITDA By Rank

Guideline Companies	EV/EBITDA forecast	
NiSource Inc	9.25	
Chesapeake Util	11.32	11.38 Harmonic Mean
UGI Corp	11.99	11.52 Low Average
NW Natural Gas	12.37	11.99 Low Median
ONE Gas Inc	12.71	12.00 Say
Southwest Gas	13.17	15.05 High Harmonic Mean
South Jersey Industries	13.44	15.71 High Average
Spire Inc	14.04	14.04 High Median
Atmos Energy Corp	14.88	15.00 Say
New Jersey Resources	23.00	

SUPPORT FOR DIRECT CAPITALIZATION EQUITY COMPONENT

2020 Assessment Year

Natural Gas Distribution

Company	Ticker	Stock Price	Revenues	Multiple	Cash Flow	Multiple	Earnings	Multiple	Book Value	Multiple
Atmos Energy Corp	ato	111.86	24.32	4.60	7.57	14.78	4.35	25.71	48.18	2.32
Chesapeake Util	cpk	81.30	37.25	2.18	6.65	12.23	3.40	23.91	35.05	2.32
New Jersey Resources	njr	44.57	29.01	1.54	2.99	14.91	1.96	22.74	17.37	2.57
NiSource Inc	ni	27.84	14.15	1.97	2.80	9.94	1.25	22.27	13.65	2.04
NW Natural Gas	nwn	73.73	24.25	3.04	4.50	16.38	2.10	35.11	25.80	2.86
South Jersey Industries	sji	32.98	17.35	1.90	2.15	15.34	1.10	29.98	15.70	2.10
Southwest Gas	swx	75.97	55.35	1.37	9.10	8.35	3.80	19.99	44.65	1.70
Spire Inc	sr	83.31	38.30	2.18	7.12	11.70	3.52	23.67	45.14	1.85
UGI Corp	ugi	45.16	35.03	1.29	4.12	10.96	2.28	19.81	18.27	2.47
ONE Gas Inc	ogs	93.57	31.20	3.00	6.95	13.46	3.51	26.66	39.95	2.34
		Mean		2.31		12.80		24.99		2.26
		Harmonic Mean		2.01		12.28		24.29		2.21
		Median		2.07		12.84		23.79		2.32
		Max		4.60		16.38		35.11		2.86
		Min		1.29		8.35		19.81		1.70
		Say		2.00		12.00		24.00		2.10

DATA INPUT

Washington State Department of Revenue

2020 Assessment Year

Natural Gas Distribution

Historic Figures (2019)															
Guideline Companies		Stock Price 12/31/19	Beta Levered	Fin'l Strength	Revenues Per Share	Cash Flow Per Share	Earnings Per Share	Dividends Per Share	Bk Value Per Share	Common Shares	Mkt/Bk	LTD (BV)	Trailing P/E Ratio	Div Yield	Calculated Debt
Name	Ticker	Yahoo	VL	VL	VL	VL	VL	VL	VL	VL	Formula	V L	V L	V L	Formula
Atmos Energy Corp	ato	111.860	0.55	A+	24.32	7.57	4.35	2.10	48.18	122,266,316	2.32	4,324,300,000	27.00	2.0%	118.43%
Chesapeake Util	cpk	81.300	0.60	A	37.25	6.65	3.40	1.55	35.05	16,403,776	2.32	375,800,000	26.90	1.7%	103.78%
New Jersey Resources	njr	44.570	0.65	A+	29.01	2.99	1.96	1.19	17.37	95,570,817	2.57	1,537,600,000	21.80	2.9%	108.73%
NiSource Inc	ni	27.840	0.55	B+	14.15	2.80	1.25	0.80	13.65	373,542,659	2.04	7,853,800,000	24.20	2.8%	111.37%
NW Natural Gas	nwn	73.730	0.55	A	24.25	4.50	2.10	1.90	25.80	30,435,575	2.86	806,000,000	34.50	2.5%	108.99%
South Jersey Industries	sjj	32.980	0.80	B++	17.35	2.15	1.10	1.20	15.70	92,392,876	2.10	2,022,800,000	28.90	4.1%	107.48%
Southwest Gas	swx	75.970	0.70	A	55.35	9.10	3.80	2.18	44.65	54,626,240	1.70	2,462,100,000	21.10	3.0%	116.15%
Spire Inc	sr	83.310	0.60	B++	38.30	7.12	3.52	2.37	45.14	51,068,070	1.85	2,484,400,000	25.40	2.9%	112.04%
ONE Gas Inc	ogs	93.570	0.60	A	31.20	6.95	3.51	2.00	39.95	52,737,473	2.34	1,285,900,000	28.50	2.3%	115.38%
UGI Corp	ugi	45.160	0.75	B++	35.03	4.12	2.28	1.15	18.27	208,548,324	2.47	5,827,600,000	15.60	3.1%	105.68%

Average	25.39
Harmonic Mean	24.33
Median	26.15

			Projected (Next Year) 2020									Income Statement		
Payout Ratio	All Div'ds to Net Profits	Rtn on Shrhldrs Equity	Revenues Per Share	Cash Flow Per Share	Earnings Per Share	Dividends Per Share	Bk Value Per Share	All Div'ds to Net Profits	Rtn on Shrhldrs Equity	CF Projection 22-24	Earnings Projection 22-24	Operating Income	Current Assets	PP & E Gross
Formula	V L	V L	V L	V L	V L	V L	V L	VL	V L	V L	V L	Morningstar	Morningstar	Morningstar
48%	48%	8.9%	24.50	8.00	4.65	2.30	52.80	50.0%	9.0%	9.80	6.00	746,058,000	458,031,000	14,180,593,000
46%	46%	9.5%	38.80	7.10	3.65	1.69	40.55	46.0%	9.0%	10.00	5.50	106,287,000	134,826,000	1,800,673,000
61%	61%	11.0%	26.55	3.05	2.05	1.27	20.65	62.0%	10.0%	3.55	2.40	153,935,000	511,606,000	3,782,359,000
64%	70%	8.0%	14.85	3.00	1.40	0.86	13.90	64.0%	8.5%	4.15	2.25	1,305,200,000	1,853,900,000	24,541,900,000
90%	90%	8.0%	25.15	4.90	2.40	1.91	26.60	79.0%	9.0%	6.45	3.50	143,474,000	270,159,000	3,605,145,000
109%	nml	7.0%	17.80	2.70	1.60	1.25	16.40	80.0%	9.5%	3.75	2.40	208,817,000	652,508,000	4,931,341,000
57%	58%	8.5%	56.90	9.75	4.25	2.30	47.40	56.0%	8.5%	12.90	5.80	371,811,000	859,856,000	9,002,681,000
67%	66%	7.3%	37.90	7.60	3.80	2.49	54.00	66.0%	7.0%	9.75	5.15	302,300,000	614,500,000	6,637,000,000
57%	57%	9.0%	32.50	7.40	3.65	2.16	41.60	59.0%	9.0%	9.30	4.75	295,228,000	506,202,000	6,433,119,000
50%	48%	10.8%	39.30	5.15	2.95	1.30	20.15	46.0%	15.0%	6.60	4.15	593,600,000	1,566,200,000	10,073,000,000
	60.4%	8.8%						60.8%	9.5%	7.63				
	58.0%	8.6%						58.7%	9.1%	6.31				
	58.0%	8.7%						60.5%	9.0%	7.95				

Balance Sheet		Cash Flow Statement		Other Financials	
Intangibles (excl. GW)	Current Liabilities	Long Term Debt Less Current Maturities	Depreciation & Amortization	Carrying Value Debt	Fair Value Debt
Morningstar	Morningstar	Morningstar	Morningstar	10-K	10-K
	1,209,440,000	3,529,452,000	391,456,000	3,560,000,000	4,216,249,000
8,129,000	423,324,000	440,168,000	45,900,000	486,600,000	505,000,000
14,611,000	446,377,000	1,537,177,000	91,730,000	1,442,845,000	1,568,864,000
	3,745,800,000	7,856,200,000	717,400,000	7,869,600,000	8,764,400,000
	442,426,000	769,081,000	91,496,000	843,988,000	919,835,000
	1,731,895,000	2,070,086,000	133,385,000	2,540,000,000	2,730,000,000
	1,079,861,000	2,300,482,000	303,237,000	2,300,482,000	2,672,077,000
	1,468,800,000	2,082,600,000	181,700,000	2,082,600,000	2,333,400,000
	872,737,000	1,286,064,000	180,395,000	1,300,000,000	1,500,000,000
1,150,400,000	2,026,900,000	5,779,900,000	448,100,000	5,856,600,000	6,189,300,000

STOCK PRICE

Washington State Department of Revenue
 2020 Assessment Year
 Natural Gas Distribution

								65.44
								Year End
Atmos Energy Corp ato								
12/31/2019	Date	Open	High	Low	Close	Adj Close*	Volume	111.860
		110.44	111.88	110.38	111.86	111.86	637,900	
New Jersey Resources njr								
12/31/2019	Date	Open	High	Low	Close	Adj Close*	Volume	44.570
		44.10	44.76	43.91	44.57	44.57	587,300	
Nisource Inc ni								
12/31/2019	Date	Open	High	Low	Close	Adj Close*	Volume	27.840
		27.55	27.85	27.45	27.84	27.84	5,308,200	
NW Natural Gas nwn								
12/31/2019	Date	Open	High	Low	Close	Adj Close*	Volume	73.730
		73.1	73.91	73.1	73.73	73.73	196,400	
South Jersey Industries sji								
12/31/2019	Date	Open	High	Low	Close	Adj Close*	Volume	32.980
		32.64	33.02	32.56	32.98	32.98	813,800	
Southwest Gas Corp swx								
12/31/2019	Date	Open	High	Low	Close	Adj Close*	Volume	75.970
		75.35	76.20	75.35	75.97	75.97	297,100	
Spire Inc sr								
12/31/2019	Date	Open	High	Low	Close	Adj Close*	Volume	83.310
		83.15	83.6	83.08	83.31	83.31	268,600	
UGI Corp ugi								
12/31/2019	Date	Open	High	Low	Close	Adj Close*	Volume	45.160
		44.67	45.34	44.54	45.16	45.16	1,272,500	
One Gas Inc ogs								
12/31/2019	Date	Open	High	Low	Close	Adj Close*	Volume	93.570
		92.83	93.92	92.83	93.57	93.57	222,000	

Source:
 finance.yahoo.com
 Historical Stock Quotes

IMPLIED PREMIUMS FOR US MARKET																	
Updated January 5, 2020																	
These implied premiums are calculated using the S&P 500.																	
Year	Earnings Yield	Dividend Yield	S&P 500	Earnings*	Dividends*	Ends + Buy	Inge in Earnings	Divid	T.Bill Rate	T.Bond Rate	Bond-Bill	Boothed Growth	Premium	Net Growth	Esed Premium	Impne d	ERP/Riskfree Rate
1960	5.34%	3.41%	58.11	3.10	1.98				2.66%	2.76%	0.10%	2.45%					
1961	4.71%	2.85%	71.55	3.37	2.04		8.60%	2.91%	2.13%	2.35%	0.22%	2.41%	2.92%		2.92%		1.24
1962	5.81%	3.40%	63.1	3.67	2.15		8.79%	5.21%	2.73%	3.85%	1.12%	4.05%	3.56%		3.56%		0.92
1963	5.51%	3.13%	75.02	4.13	2.35		12.75%	9.45%	3.12%	4.14%	1.02%	4.96%	3.38%		3.38%		0.82
1964	5.62%	3.05%	84.75	4.76	2.58		15.23%	10.08%	3.54%	4.21%	0.67%	5.13%	3.31%		3.31%		0.79
1965	5.73%	3.06%	92.43	5.30	2.83		11.20%	9.42%	3.93%	4.65%	0.72%	5.46%	3.32%		3.32%		0.71
1966	6.74%	3.59%	80.33	5.41	2.88		2.23%	1.96%	4.76%	4.64%	-0.12%	4.19%	3.68%		3.68%		0.79
1967	5.66%	3.09%	96.47	5.46	2.98		0.85%	3.37%	4.21%	5.70%	1.49%	5.25%	3.20%		3.20%		0.56
1968	5.51%	2.93%	103.86	5.72	3.04		4.81%	2.09%	5.21%	6.16%	0.95%	5.32%	3.00%		3.00%		0.49
1969	6.63%	3.52%	92.06	6.10	3.24		6.66%	6.49%	6.58%	7.88%	1.30%	7.55%	3.74%		3.74%		0.47
1970	5.98%	3.46%	92.15	5.51	3.19		-9.72%	-1.61%	6.53%	6.50%	-0.03%	4.78%	3.41%		3.41%		0.52
1971	5.46%	3.10%	102.09	5.57	3.16		1.15%	-0.74%	4.39%	5.89%	1.50%	4.57%	3.09%		3.09%		0.52
1972	5.23%	2.70%	118.05	6.17	3.19		10.76%	0.71%	3.84%	6.41%	2.57%	5.21%	2.72%		2.72%		0.42
1973	8.16%	3.70%	97.55	7.96	3.61		28.93%	13.24%	6.93%	6.90%	-0.03%	8.30%	4.30%		4.30%		0.62
1974	13.64%	5.43%	68.56	9.35	3.72		17.48%	3.14%	8.00%	7.40%	-0.60%	6.42%	5.59%		5.59%		0.76
1975	8.55%	4.14%	90.19	7.71	3.73		-17.54%	0.30%	5.80%	7.76%	1.96%	5.99%	4.13%		4.13%		0.53
1976	9.07%	3.93%	107.46	9.75	4.22		26.99%	13.10%	5.08%	6.81%	1.73%	8.19%	4.55%		4.55%		0.67
1977	11.43%	5.11%	95.1	10.87	4.86		11.53%	15.07%	5.12%	7.78%	2.66%	9.52%	5.92%		5.92%		0.76
1978	12.11%	5.39%	96.11	11.64	5.18		7.07%	6.60%	7.18%	9.15%	1.97%	8.48%	5.72%		5.72%		0.63
1979	13.48%	5.53%	107.94	14.55	5.97		25.01%	15.23%	10.38%	10.33%	-0.05%	11.70%	6.45%		6.45%		0.62
1980	11.04%	4.74%	135.76	14.99	6.44		3.01%	7.81%	11.24%	12.43%	1.19%	11.01%	5.03%		5.03%		0.40
1981	12.39%	5.57%	122.55	15.18	6.83		1.31%	6.08%	14.71%	13.98%	-0.73%	11.42%	5.73%		5.73%		0.41
1982	9.83%	4.93%	140.64	13.82	6.93		-8.95%	1.58%	10.54%	10.47%	-0.07%	7.96%	4.90%		4.90%		0.47
1983	8.06%	4.32%	164.93	13.29	7.12		-3.84%	2.76%	8.80%	11.80%	3.00%	9.09%	4.31%		4.31%		0.37
1984	10.07%	4.68%	167.24	16.84	7.83		26.69%	9.85%	9.85%	11.51%	1.66%	11.02%	5.11%		5.11%		0.44
1985	7.42%	3.88%	211.28	15.68	8.20		-6.91%	4.74%	7.72%	8.99%	1.27%	7.89%	4.03%	6.75%	3.84%		0.43
1986	5.96%	3.38%	242.17	14.43	8.19		-7.93%	-0.15%	6.16%	7.22%	1.06%	5.54%	3.36%	6.96%	3.58%		0.50
1987	6.49%	3.71%	247.08	16.04	9.17		11.10%	11.99%	5.47%	8.86%	3.39%	9.66%	4.18%	8.58%	3.99%		0.45
1988	8.20%	3.68%	277.72	24.12	10.22		50.42%	11.49%	6.35%	9.14%	2.79%	9.76%	4.12%	7.67%	3.77%		0.41
1989	6.80%	3.32%	353.4	24.32	11.73		0.83%	14.80%	8.37%	7.93%	-0.44%	9.58%	3.85%	7.46%	3.51%		0.44
1990	6.58%	3.74%	330.22	22.65	12.35		-6.87%	5.26%	7.81%	8.07%	0.26%	7.39%	3.92%	7.19%	3.89%		0.48
1991	4.58%	3.11%	417.09	19.30	12.97		-14.79%	5.03%	7.00%	6.70%	-0.30%	6.34%	3.27%	7.81%	3.48%		0.52
1992	4.16%	2.90%	435.71	20.87	12.64		8.13%	-2.59%	5.30%	6.68%	1.38%	4.67%	2.83%	9.83%	3.55%		0.53
1993	4.25%	2.72%	466.45	26.90	12.69		28.89%	0.41%	3.50%	5.79%	2.29%	4.73%	2.74%	8.00%	3.17%		0.55
1994	5.89%	2.91%	459.27	31.75	13.36		18.03%	5.34%	5.00%	7.82%	2.82%	7.23%	3.06%	7.17%	3.55%		0.45
1995	5.74%	2.30%	615.93	37.70	14.17		18.74%	6.00%	3.50%	5.57%	2.07%	5.65%	2.44%	6.50%	3.29%		0.59
1996	4.83%	2.01%	740.74	40.63	14.89		7.77%	5.10%	5.00%	6.41%	1.41%	6.13%	2.11%	7.92%	3.20%		0.50
1997	4.08%	1.60%	970.43	44.09	15.52		8.52%	4.25%	5.35%	5.74%	0.39%	5.45%	1.67%	8.00%	2.73%		0.48
1998	3.11%	1.32%	1229.23	44.27	16.20		0.41%	4.37%	4.33%	4.65%	0.32%	4.60%	1.38%	7.20%	2.26%		0.49
1999	3.07%	1.14%	1469.25	51.68	16.71		16.74%	3.16%	5.37%	6.44%	1.07%	5.75%	1.20%	12.50%	2.05%		0.32
2000	3.94%	1.23%	1320.28	56.13	16.27		8.61%	-2.65%	5.73%	5.11%	-0.62%	3.71%	1.65%	12.00%	2.87%		0.56
2001	3.85%	1.37%	1148.09	38.85	15.74	30.08	-30.79%	-3.24%	1.80%	5.05%	3.25%	3.56%	1.73%	10.30%	3.62%	2.91%	0.72
2002	5.23%	1.83%	879.82	46.04	16.08	29.83	18.51%	2.15%	1.20%	3.81%	2.61%	3.57%	2.29%	8.00%	4.10%	4.73%	1.08
2003	4.87%	1.61%	1111.91	54.69	17.88	31.58	18.79%	11.19%	1.00%	4.25%	3.25%	5.35%	2.12%	11.00%	3.69%	4.74%	0.87
2004	5.58%	1.60%	1211.92	67.68	19.407	40.60	23.75%	8.54%	2.18%	4.22%	2.04%	4.90%	2.02%	8.50%	3.65%	4.86%	0.86
2005	5.47%	1.79%	1248.29	76.45	22.38	61.17	12.96%	15.32%	4.31%	4.99%	0.08%	6.16%	2.20%	8.00%	4.08%	5.22%	0.93
2006	6.18%	1.77%	1418.3	87.72	25.05	73.16	14.74%	11.93%	4.88%	4.70%	-0.18%	5.93%	1.97%	12.50%	4.16%	6.12%	0.89
2007	5.62%	1.89%	1468.36	82.54	27.73	95.36	-5.91%	10.70%	3.31%	4.02%	0.71%	5.03%	2.06%	5.00%	4.37%	4.59%	1.09
2008	7.24%	3.11%	903.25	65.39	28.05	67.52	-20.78%	1.15%	1.59%	2.21%	0.62%	2.11%	4.05%	4.00%	6.43%	6.92%	2.91
2009	5.35%	2.00%	1115.10	59.65	22.31	37.43	-8.78%	-20.46%	0.14%	3.84%	3.70%	0.28%	2.60%	7.20%	4.36%	4.64%	1.14
2010	6.65%	1.84%	1257.64	83.66	23.12	55.53	40.25%	3.63%	0.13%	3.29%	3.16%	3.33%	2.24%	6.95%	5.20%	6.09%	1.58
2011	7.72%	2.07%	1257.60	97.05	26.02	71.28	16.01%	12.54%	0.03%	1.88%	1.85%	2.75%	2.71%	7.18%	6.01%	8.34%	3.20
2012	7.18%	2.13%	1426.19	102.47	30.44	75.90	5.58%	16.99%	0.05%	1.76%	1.71%	2.93%	2.47%	5.27%	5.78%	7.30%	3.28
2013	5.81%	1.96%	1848.36	107.45	36.28	88.13	4.86%	19.19%	0.07%	3.04%	2.97%	5.01%	2.03%	4.28%	4.96%	4.99%	1.63
2014	5.49%	1.92%	2058.90	113.01	39.44	101.98	5.17%	8.71%	0.05%	2.17%	2.12%	2.77%	2.24%	5.58%	5.78%	5.48%	2.66
2015	5.20%	2.11%	2043.94	106.32	43.16	106.10	-5.92%	9.43%	0.21%	2.27%	2.06%	2.96%	2.46%	5.51%	6.12%	5.16%	2.70
2016	4.86%	2.01%	2238.83	108.86	45.03	108.67	2.39%	4.33%	0.51%	2.45%	1.94%	2.64%	2.41%	5.54%	5.69%	4.50%	2.32
2017	4.67%	1.86%	2673.61	124.94	49.73	108.28	14.77%	10.44%	1.39%	2.41%	1.02%	3.22%	2.36%	7.05%	5.08%	4.75%	2.11
2018	5.92%	2.14%	2506.85	148.34	53.61	136.65	18.73%	7.80%	2.37%	2.68%	0.31%	3.24%	2.50%	4.12%	5.96%	5.55%	2.22
2019	5.03%	1.82%	3230.78	162.35	58.80	150.50	9.44%	9.68%	1.55%	1.92%	0.37%	2.57%		3.96%	5.20%	5.06%	2.71

<http://pages.stern.nyu.edu/~adamodar/>

Three Stage Free Cash Flow to Equity Discount Model

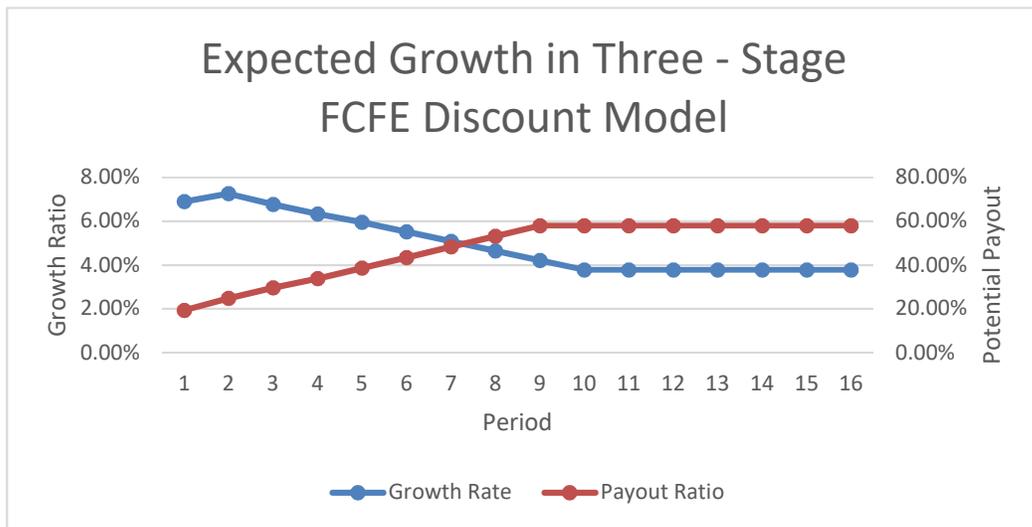
Company **Atmos Energy Corp**

Ticker **ato**

3.90% GDP
 22 Industry P/E
 58.0% Target Dividend Payout Ratio
 9.0% Target ROE

	Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
Historic	0		76.63%	23.37%	4.35			(111.86)
	1	6.90%	80.65%	19.35%	4.65	0.90		0.90
	2	7.26%	75.19%	24.81%	4.99	1.24		1.24
Stage 1	3	6.77%	70.42%	29.58%	5.33	1.57		1.57
	4	6.34%	66.23%	33.77%	5.66	1.91		1.91
	5	5.96%	61.38%	38.62%	6.00	2.32		2.32
	6	5.52%	56.54%	43.46%	6.33	2.75		2.75
	7	5.09%	51.69%	48.31%	6.65	3.21		3.21
Stage 2	8	4.65%	46.85%	53.15%	6.96	3.70		3.70
	9	4.22%	42.00%	58.00%	7.26	4.21		4.21
	10	3.78%	42.00%	58.00%	7.53	4.37	171.95	176.31
Stage 3	11+	3.78%	42.00%	58.00%	7.82	4.53		

$K_e = 6.20\%$



Three Stage Free Cash Flow to Equity Discount Model

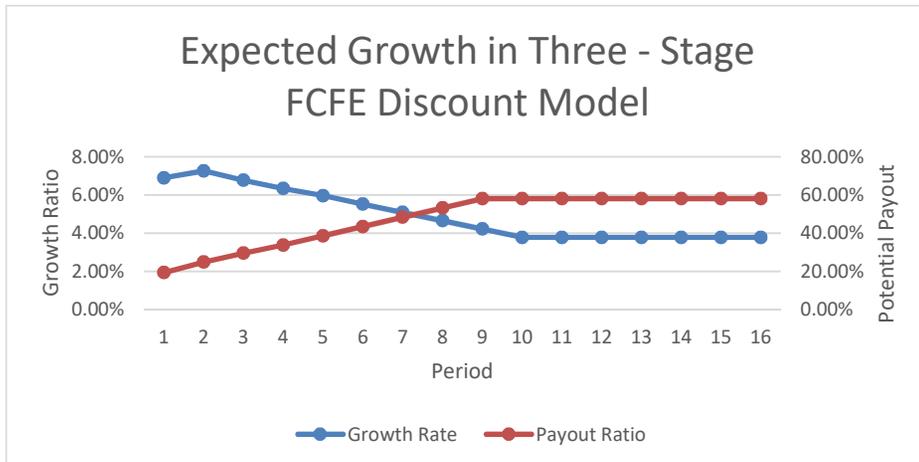
Company **Chesapeake Utilities**

Ticker **cpk**

3.90%	GDP
22	Industry P/E
58.0%	Target Dividend Payout Ratio
9.0%	Target ROE

	Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
Historic	0		81.70%	18.30%	3.40			(81.30)
	1	7.35%	140.79%	-40.79%	3.65	(1.49)		-1.49
	2	12.67%	124.96%	-24.96%	4.11	(1.03)		-1.03
Stage 1	3	11.25%	112.33%	-12.33%	4.58	(0.56)		-0.56
	4	10.11%	102.01%	-2.01%	5.04	(0.10)		-0.10
	5	9.18%	90.01%	9.99%	5.50	0.55		0.55
	6	8.10%	78.01%	21.99%	5.95	1.31		1.31
	7	7.02%	66.01%	33.99%	6.36	2.16		2.16
Stage 2	8	5.94%	54.00%	46.00%	6.74	3.10		3.10
	9	4.86%	42.00%	58.00%	7.07	4.10		4.10
	10	3.78%	42.00%	58.00%	7.34	4.25	167.49	171.74
Stage 3	11+	3.78%	42.00%	58.00%	7.61	4.42		

$K_e = 8.22\%$



Three Stage Free Cash Flow to Equity Discount Model

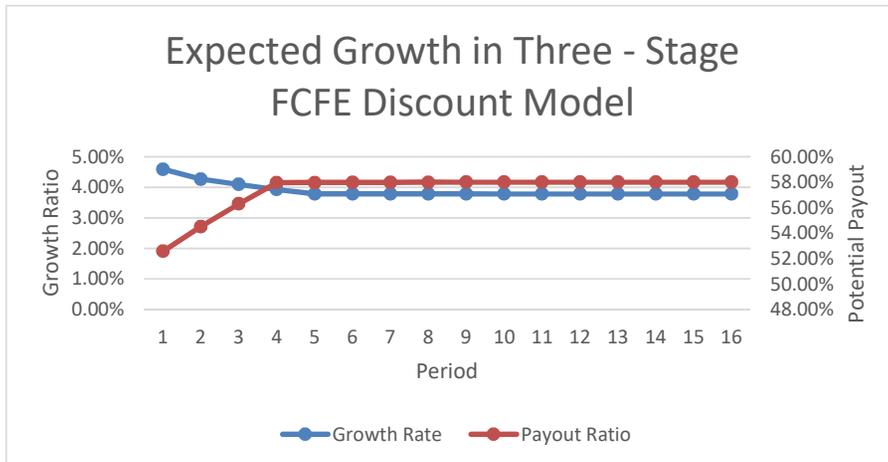
Company **New Jersey Resources**

Ticker **njr**

3.90%	GDP
22.0	Industry P/E
58.0%	Target Dividend Payout Ratio
9.0%	Target ROE

	Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
Historic	0		51.02%	48.98%	1.96			(44.57)
	1	4.59%	47.43%	52.57%	2.05	1.08		1.08
	2	4.27%	45.48%	54.52%	2.14	1.17		1.17
Stage 1	3	4.09%	43.70%	56.30%	2.23	1.25		1.25
	4	3.93%	42.04%	57.96%	2.31	1.34		1.34
	5	3.78%	42.03%	57.97%	2.40	1.39		1.39
	6	3.78%	42.03%	57.97%	2.49	1.44		1.44
	7	3.78%	42.02%	57.98%	2.59	1.50		1.50
Stage 2	8	3.78%	42.01%	57.99%	2.68	1.56		1.56
	9	3.78%	42.00%	58.00%	2.78	1.61		1.61
	10	3.78%	42.00%	58.00%	2.89	1.68	65.97	67.65
Stage 3	11+	3.78%	42.00%	58.00%	3.00	1.74		

$K_e = 6.61\%$



Three Stage Free Cash Flow to Equity Discount Model

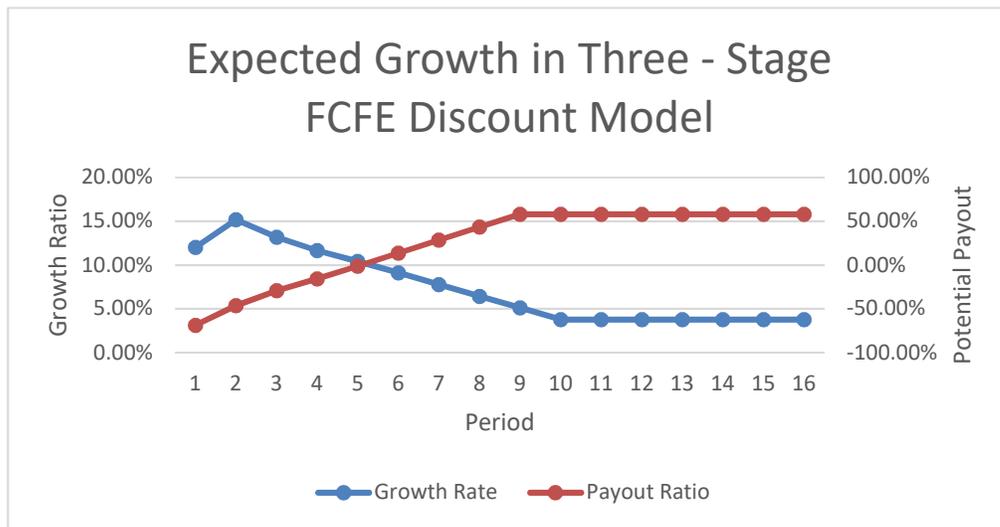
Company **Nisource Inc**

Ticker **ni**

3.90% GDP
 22.0 Industry P/E
 58.0% Target Dividend Payout Ratio
 9.0% Target ROE

	Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
Historic	0		133.33%	-33.33%	1.25			(27.84)
Stage 1	1	12.00%	168.65%	-68.65%	1.40	(0.96)		-0.96
	2	15.18%	146.43%	-46.43%	1.61	(0.75)		-0.75
	3	13.18%	129.38%	-29.38%	1.83	(0.54)		-0.54
	4	11.64%	115.88%	-15.88%	2.04	(0.32)		-0.32
	5	10.43%	101.11%	-1.11%	2.25	(0.02)		-0.02
Stage 2	6	9.10%	86.33%	13.67%	2.45	0.34		0.34
	7	7.77%	71.55%	28.45%	2.65	0.75		0.75
	8	6.44%	56.78%	43.22%	2.82	1.22		1.22
	9	5.11%	42.00%	58.00%	2.96	1.72		1.72
	10	3.78%	42.00%	58.00%	3.07	1.78	70.13	71.91
Stage 3	11+	3.78%	42.00%	58.00%	3.19	1.85		

K_e = 9.86%



Three Stage Free Cash Flow to Equity Discount Model

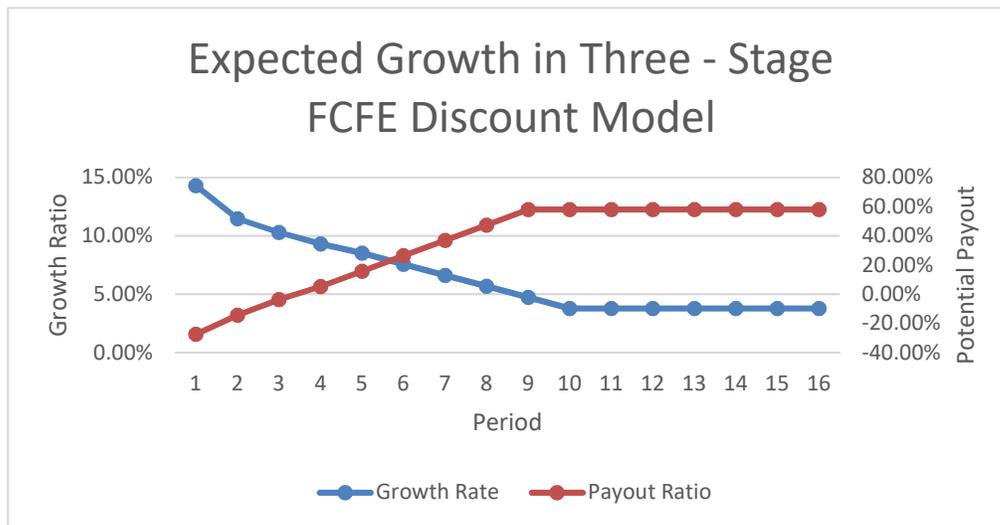
Company **NW Nat'l Gas**

Ticker **nwn**

3.90% GDP
 22.0 Industry P/E
 58.0% Target Dividend Payout Ratio
 9.0% Target ROE

	Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
Historic	0		158.73%	-58.73%	2.10			(73.73)
	1	14.29%	127.31%	-27.31%	2.40	(0.66)		-0.66
	2	11.46%	114.23%	-14.23%	2.68	(0.38)		-0.38
Stage 1	3	10.28%	103.58%	-3.58%	2.95	(0.11)		-0.11
	4	9.32%	94.75%	5.25%	3.23	0.17		0.17
	5	8.53%	84.20%	15.80%	3.50	0.55		0.55
	6	7.58%	73.65%	26.35%	3.77	0.99		0.99
	7	6.63%	63.10%	36.90%	4.01	1.48		1.48
Stage 2	8	5.68%	52.55%	47.45%	4.24	2.01		2.01
	9	4.73%	42.00%	58.00%	4.44	2.58		2.58
	10	3.78%	42.00%	58.00%	4.61	2.67	105.29	107.96
Stage 3	11+	3.78%	42.00%	58.00%	4.79	2.78		

Ke = 4.54%



Three Stage Free Cash Flow to Equity Discount Model

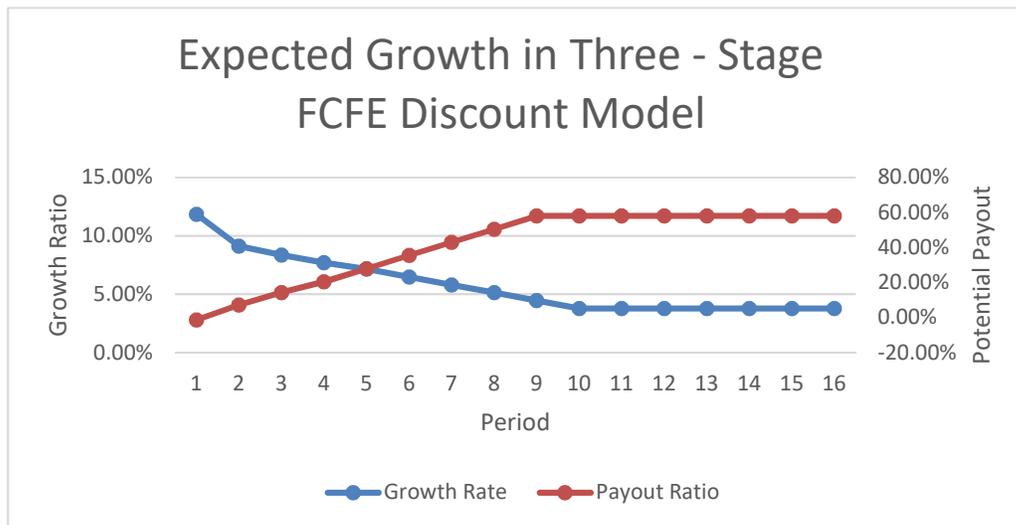
Company **Southwest Gas**

Ticker **SWX**

3.90% GDP
 22.0 Industry P/E
 58.0% Target Dividend Payout Ratio
 9.0% Target ROE

	Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
Historic	0		131.58%	-31.58%	3.80			(75.97)
	1	11.84%	101.31%	-1.31%	4.25	(0.06)		-0.06
	2	9.12%	92.84%	7.16%	4.64	0.33		0.33
Stage 1	3	8.36%	85.68%	14.32%	5.03	0.72		0.72
	4	7.71%	79.55%	20.45%	5.41	1.11		1.11
	5	7.16%	72.04%	27.96%	5.80	1.62		1.62
	6	6.48%	64.53%	35.47%	6.18	2.19		2.19
	7	5.81%	57.02%	42.98%	6.53	2.81		2.81
Stage 2	8	5.13%	49.51%	50.49%	6.87	3.47		3.47
	9	4.46%	42.00%	58.00%	7.18	4.16		4.16
	10	3.78%	42.00%	58.00%	7.45	4.32	170.04	174.36
Stage 3	11+	3.78%	42.00%	58.00%	7.73	4.48		

$K_e = 9.98\%$



Three Stage Free Cash Flow to Equity Discount Model

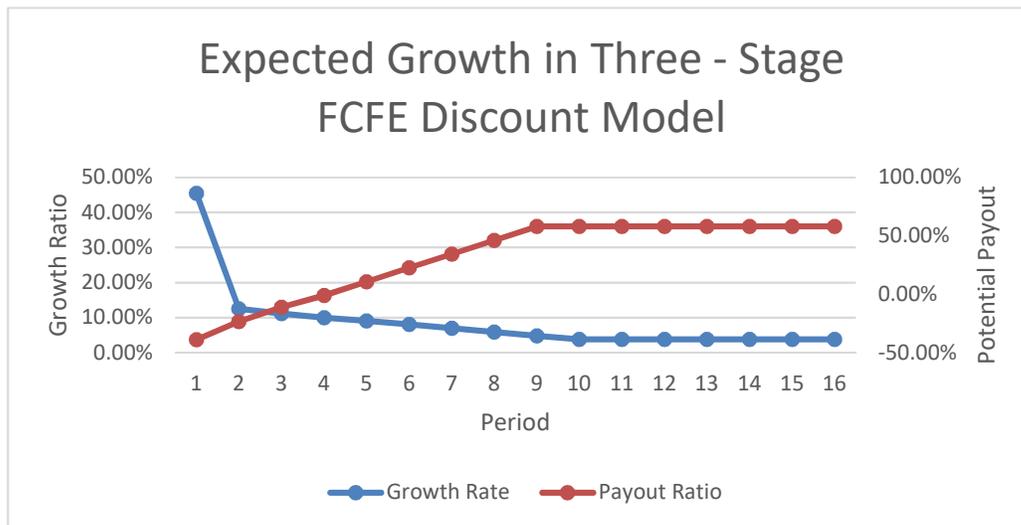
Company **South Jersey Industries**

Ticker **sjj**

3.90% GDP
 22.0 Industry P/E
 58.0% Target Dividend Payout Ratio
 9.0% Target ROE

	Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
Historic	0		505.05%	-405.05%	1.10			(32.98)
	1	45.45%	138.89%	-38.89%	1.60	(0.62)		-0.62
	2	12.50%	123.46%	-23.46%	1.80	(0.42)		-0.42
Stage 1	3	11.11%	111.11%	-11.11%	2.00	(0.22)		-0.22
	4	10.00%	101.01%	-1.01%	2.20	(0.02)		-0.02
	5	9.09%	89.21%	10.79%	2.40	0.26		0.26
	6	8.03%	77.41%	22.59%	2.59	0.59		0.59
	7	6.97%	65.60%	34.40%	2.77	0.95		0.95
Stage 2	8	5.90%	53.80%	46.20%	2.94	1.36		1.36
	9	4.84%	42.00%	58.00%	3.08	1.79		1.79
	10	3.78%	42.00%	58.00%	3.20	1.85	72.96	74.82
Stage 3	11+	3.78%	42.00%	58.00%	3.32	1.92		

$K_e = 9.02\%$



Three Stage Free Cash Flow to Equity Discount Model

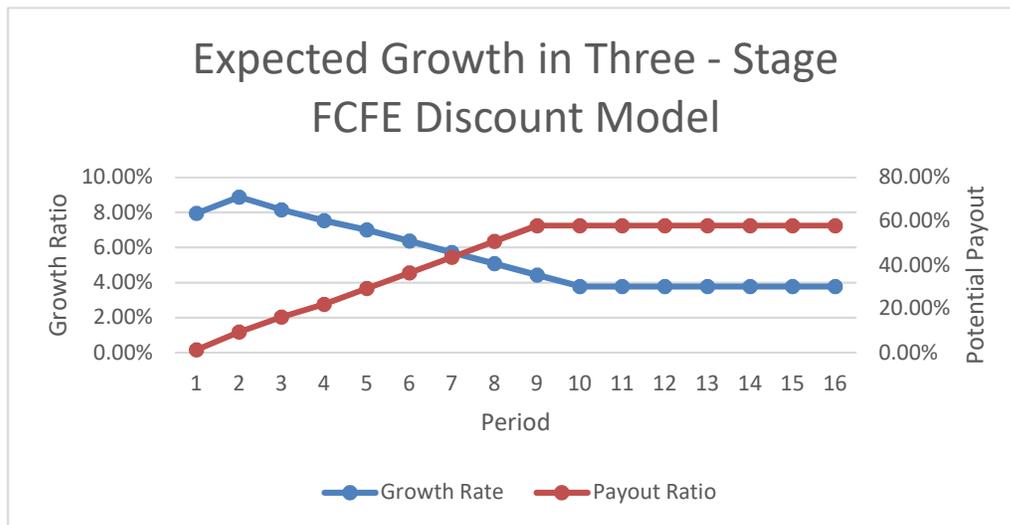
Company **Spire Inc**

Ticker **sr**

3.90% GDP
 22.0 Industry P/E
 58.0% Target Dividend Payout Ratio
 9.0% Target ROE

	Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
Historic	0		88.38%	11.62%	3.52			(83.31)
	1	7.95%	98.68%	1.32%	3.80	0.05		0.05
	2	8.88%	90.63%	9.37%	4.14	0.39		0.39
Stage 1	3	8.16%	83.80%	16.20%	4.48	0.73		0.73
	4	7.54%	77.92%	22.08%	4.81	1.06		1.06
	5	7.01%	70.74%	29.26%	5.15	1.51		1.51
	6	6.37%	63.55%	36.45%	5.48	2.00		2.00
	7	5.72%	56.37%	43.63%	5.79	2.53		2.53
Stage 2	8	5.07%	49.18%	50.82%	6.08	3.09		3.09
	9	4.43%	42.00%	58.00%	6.35	3.69		3.69
	10	3.78%	42.00%	58.00%	6.59	3.82	150.56	154.39
Stage 3	11+	3.78%	42.00%	58.00%	6.84	3.97		

$K_e = 7.62\%$



Three Stage Free Cash Flow to Equity Discount Model

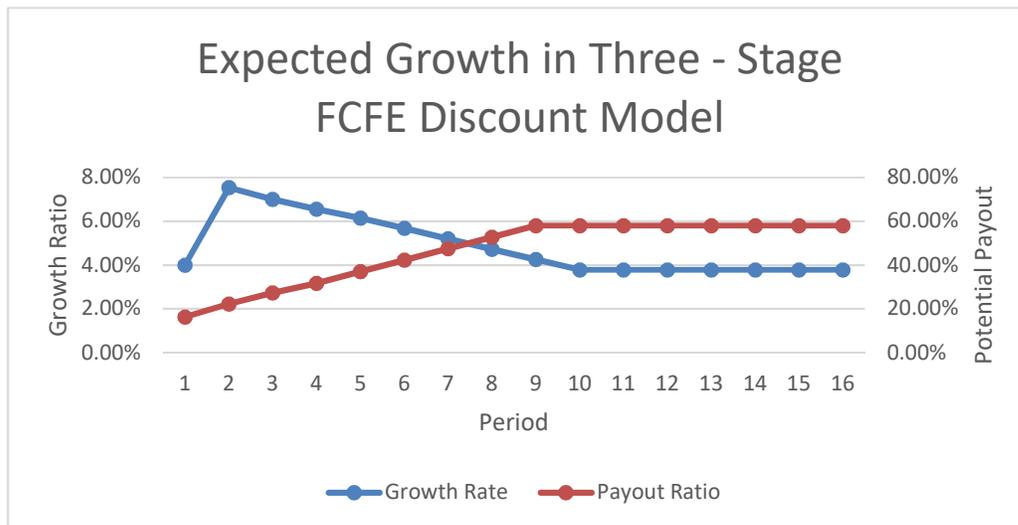
Company **ONE Gas Inc**

Ticker **ogs**

3.90% GDP
 22.0 Industry P/E
 58.0% Target Dividend Payout Ratio
 9.0% Target ROE

	Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
Historic	0		44.32%	55.68%	3.51			(93.57)
	1	3.99%	83.71%	16.29%	3.65	0.59		0.59
	2	7.53%	77.85%	22.15%	3.93	0.87		0.87
Stage 1	3	7.01%	72.75%	27.25%	4.20	1.14		1.14
	4	6.55%	68.28%	31.72%	4.48	1.42		1.42
	5	6.15%	63.02%	36.98%	4.75	1.76		1.76
	6	5.67%	57.77%	42.23%	5.02	2.12		2.12
	7	5.20%	52.51%	47.49%	5.28	2.51		2.51
Stage 2	8	4.73%	47.26%	52.74%	5.53	2.92		2.92
	9	4.25%	42.00%	58.00%	5.77	3.34		3.34
	10	3.78%	42.00%	58.00%	5.98	3.47	136.60	140.07
Stage 3	11+	3.78%	42.00%	58.00%	6.21	3.60		

$K_e = 5.56%$



Three Stage Free Cash Flow to Equity Discount Model

Company **UGI Corp**

Ticker **ugi**

3.90% GDP
 22.0 Industry P/E
 58.0% Target Dividend Payout Ratio
 9.0% Target ROE

	Year	Growth Rate	Reinvestment Rate	Payout Ratio	Earnings	FCFE	Terminal Value	Cash Flow
Historic	0		326.51%	-226.51%	2.28			(45.16)
	1	29.39%	112.99%	-12.99%	2.95	(0.38)		-0.38
	2	10.17%	102.56%	-2.56%	3.25	(0.08)		-0.08
Stage 1	3	9.23%	93.90%	6.10%	3.55	0.22		0.22
	4	8.45%	86.58%	13.42%	3.85	0.52		0.52
	5	7.79%	77.66%	22.34%	4.15	0.93		0.93
	6	6.99%	68.75%	31.25%	4.44	1.39		1.39
	7	6.19%	59.83%	40.17%	4.71	1.89		1.89
Stage 2	8	5.38%	50.92%	49.08%	4.97	2.44		2.44
	9	4.58%	42.00%	58.00%	5.20	3.01		3.01
	10	3.78%	42.00%	58.00%	5.39	3.13	123.13	126.25
Stage 3	11+	3.78%	42.00%	58.00%	5.60	3.25		

$K_e = 11.93\%$

